

AMENDMENTS TO THE CLAIMS

Claims 1-36 (canceled)

37. (New) A gene detection system for detecting a target gene upon hybridization with a probe, said gene detection system comprising:

an electrode substrate having a first surface and a second surface, the first surface being opposite to the second surface through the electrode substrate;

an electrode provided on the first surface, the electrode having a probe immobilizing surface;

a soaking component provided on the second surface;

heating and cooling means provided on the soaking component; and

a heat insulating member covering a circumferential surface of the electrode,

wherein a thermal capacity of the soaking component is greater than that of the electrode substrate.

38. (New) The gene detection system according to Claim 37, wherein the soaking component comprises a temperature sensor for measuring a temperature of the soaking component.

39. (New) The gene detection system according to Claim 37, wherein the heating and cooling means comprises a Peltier element or a heater.

40. (New) The gene detection system according to Claim 37, wherein the heating and cooling means comprises a heat sink at an opposite side from the soaking component.

41. (New) The gene detection system according to Claim 37, wherein at least a portion of a surface of the electrode comprises gold, silver, or copper, and the electrode substrate comprises a ceramic material.

42. (New) The gene detection system according to Claim 37, wherein the electrode comprises a plurality of electrodes.

43. (New) The gene detection system according to Claim 42, wherein each of a plurality of probes is immobilized on each of the plurality of electrodes, and wherein each of the plurality of probes detects a predetermined base sequence different from each of the other plurality of probes.

44. (New) The gene detection system according to Claim 42, wherein the heating and cooling means independently controls a temperature of each of the plurality of electrodes.

45. (New) The gene detection system according to Claim 43, wherein the heating and cooling means independently controls a temperature of each of the plurality of electrodes.

46. (New) The gene detection system according to Claim 37, wherein the electrode forms a pin.

47. (New) The gene detection system according to Claim 37, wherein the heat insulating member comprises polyether ether ketone or polytetrafluoroethylene.

48. (New) A gene detection device, comprising:
the gene detection system according to any one of Claims 37-47; and
control means for controlling an actuation of the heating and cooling means.

49. (New) A gene detection system comprising:
an electrode substrate having a first surface and a second surface, the first surface being opposite to the second surface through the electrode substrate;
a cylindrical electrode projecting from the first surface of the electrode substrate, wherein a probe-immobilizing surface of the cylindrical electrode is disposed away from the electrode substrate, and wherein an insulating member substantially covers a circumferential surface of the cylindrical electrode;
a soaking component provided on the second surface; and

heating and cooling means disposed in contact with the soaking component, wherein a thermal capacity of the soaking component is greater than that of the electrode substrate.

50. (New) The gene detection system according to Claim 49, wherein the soaking component comprises a temperature sensor for measuring a temperature of the soaking component.

51. (New) The gene detection system according to Claim 49, wherein the heating and cooling means comprises a Peltier element or a heater.

52. (New) The gene detection system according to Claim 49, wherein the heating and cooling means comprises a heat sink at an opposite side from the soaking component.

53. (New) The gene detection system according to Claim 49, wherein at least a portion of a surface of the cylindrical electrode comprises gold, silver, or copper, and the electrode substrate comprises a ceramic material.

54. (New) The gene detection system according to Claim 49, wherein the cylindrical electrode comprises a plurality of cylindrical electrodes.

55. (New) The gene detection system according to Claim 54, wherein each of a plurality of probes is immobilized on each of the plurality of cylindrical electrodes, and wherein each of the plurality of probes detects a predetermined base sequence different from each of the other plurality of probes.

56. (New) The gene detection system according to Claim 54, wherein the heating and cooling means independently controls a temperature of each of the plurality of cylindrical electrodes.

57. (New) The gene detection system according to Claim 55, wherein the heating and cooling means independently controls a temperature of each of the plurality of cylindrical electrodes.

58. (New) The gene detection system according to Claim 49, wherein the cylindrical electrode forms a pin.

59. (New) The gene detection system according to Claim 49, wherein the heat insulating member comprises polyether ether ketone or polytetrafluoroethylene.

60. (New) A gene detection device, comprising:
the gene detection system according to any one of Claim 49-59; and
control means for controlling an actuation of the heating and cooling means.